

## NEMATODES CAUSING DECLINE OF BOXWOOD

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Plant parasitic nematodes are important pests of woody ornamental plants (2,7). Almost 40 years ago, boxwood, Buxus sp., was reported as a host of lesion nematodes, and research since that time has shown that lesion, spiral, and root-knot nematodes can cause decline of boxwood (2,3,4,5,8,9). Infected plants usually decline over a period of several years, but occasionally plants may die suddenly, especially if the effect of nematodes is compounded by other factors causing stress. Symptoms of nematode damage usually are most apparent during late summer and fall or during extended dry periods.

**ROOT-KNOT NEMATODES:** Based on results from samples submitted to the Division of Plant Industry of the Florida Department of Agriculture and Consumer Services, root-knot nematodes, Meloidogyne sp., are more frequently associated with boxwood in Florida than any other genus of plant parasitic nematodes. Frequency of occurrence for various genera infecting boxwood at 41 sites sampled in Florida during the past 10 years was the following: Meloidogyne sp. (66%); Helicotylenchus sp. (10%); Scutellonema sp. (10%); Xiphinema sp. (10%); Belonolaimus sp. (7%); Hoplolaimus sp. (5%); Pratylenchus sp. (5%); Tylenchorhynchus sp. (5%); Heterodera sp. (2%); Hemicriciconemoides sp. (2%); and Xenocriciconemella sp. (2%). In Florida, Meloidogyne incognita (Kofoid and White) Chitwood and M. arenaria (Neal) Chitwood have both been observed to occur on Japanese boxwood, Buxus microphylla Sieb. & Zucc. At higher population levels, root galling may be severe, and the development of fibrous roots is greatly limited (Fig. 1).

**LESION NEMATODES:** Symptoms associated with lesion nematode damage are chlorosis and bronzing of foliage, necrosis of affected roots, and general stunting of roots and tops of plants. Pratylenchus pratensis (de Man) Filipjev and P. vulnus Allen & Jensen are known to cause these symptoms (3,8,9), and the pathogenicity of P. vulnus to Japanese boxwood, B. microphylla, and common boxwood, B. sempervirens L., has been demonstrated in greenhouse and microplot studies (2,3,8). A density of approximately 140 P. vulnus/100 cc of soil caused a severe decline of boxwood in the greenhouse (8). In microplot studies, populations of approximately 33 P. vulnus/100 cc of soil were found to suppress growth by 50% as compared to noninoculated control plants (3).

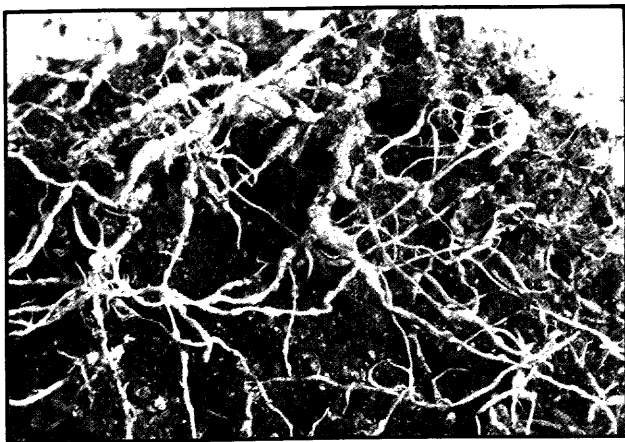


Fig. 1. Galls caused by Meloidogyne incognita on the roots of boxwood, Buxus microphylla, grown in a commercial nursery. (Partial view of the outer portion of the root system after removing it from the pot.) (Photo credit: J. Windsor; DPI neg. #702942)

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SPIRAL NEMATODES: A spiral nematode, Rotylenchus buxophilus Golden, was found to be widely associated with boxwood in Maryland, Pennsylvania, South Carolina, West Virginia, and Virginia (4). At high numbers, this nematode was found to be pathogenic to B. sempervirens and caused significant reduction of average root growth of inoculated plants (4). Boxwood is a good host of another spiral nematode, Helicotylenchus dihystrera (Cobb) Sher. It appears, however, that B. sempervirens is tolerant of H. dihystrera, because very high numbers of this nematode did not cause a significant reduction of plant growth in field microplot studies (3). In contrast, in this same study, approximately one-tenth as many lesion nematodes, P. vulnus, caused significant stunting of boxwood.

CONTROL: Certain nematicides have been shown in experimental studies to reduce nematode populations on boxwood (1,5,7), and a few chemicals are registered for use in commercial nurseries. However, it is difficult to eradicate populations of nematodes. Moreover, homeowners have few options to control nematodes on established landscape plants; thus, it is imperative that commercial growers exercise every reasonable sanitation practice to prevent unnecessary nematode problems.

SURVEY AND DETECTION: Symptoms associated with boxwood decline caused by nematodes are poor growth and vigor, yellow or bronzed foliage, dieback of branches, and restricted or distorted root systems. When damage by plant parasitic nematodes is suspected, soil and root samples should be submitted to a laboratory capable of diagnosing plant problems caused by nematodes.

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